



**USER'S GUIDE TO COMPUTER TOOLS FOR INFORMATION
SHARING IN THE SOUTHWEST**

SWEPIC, SWEMP AND SW-WIMS

With Appendices

The SWEMP Team
Colorado Plateau Research Station
Southwest Biological Science Center
U.S. Geological Survey

Version 1.0a
6.30.05

Table of Contents

Table of Contents	2
Computer Tools and Information Sharing	3
Organization of this Manual	3
The SWEMP Team	4
Southwest Exotic Plant Information Clearinghouse (SWEPIC)	4
SWEPIC Features	5
Weed Species	5
Weed Lists	5
Maps	6
SWEMP	6
Alien Plant Ranking System (APRS)	6
Arizona Wildlands Invasive Plants (AZ-WIP)	6
Southwest Exotic Plant Mapping Program (SWEMP)	6
Collaborate with SWEMP	7
Who is a Collaborator?	7
What to Collect	7
How to Submit Data	7
Use the SWEMP Database	8
Southwest - Weed Information Management System (SW-WIMS)	9
Appendices	9
Appendix A: Tips for Using the SWEMP IMS	9
Getting Started	9
Basic Navigation	10
Making and exploring a map display	12
Examples of common SWEMP IMS activities	14
Appendix B: Guide to the SWEMP Database	18
Important database terminology	18
How to Collaborate	19
Database Fields	19
Appendix C: Tips for Using the SWEMP Data Query Tool	35
Appendix D: Tips for Using SW-WIMS	35
Appendix E: Tips for SWEMP Web Data Entry	37
Appendix F: Weed Management Activities and Computer Tools	37

Computer Tools and Information Sharing

Up-to-date information on non-native invasive plants, referred to as weeds in this manual, is essential for effective risk assessment, management or eradication planning, and policy development. The nature of weed infestations and the issues raised by weed invasions necessitate cooperation across administrative boundaries. Weed infestations do not care about land ownership lines. In addition, identification of the problems and actions taken to address the problems involve many entities: federal, tribal, state, and county governments; non-government organizations; industry and private landowners.

Efforts to manage weeds in the Southwest include the need to identify the location of weed infestations and to document their extent in both time and space. These data may indicate early detection of a new weed or may indicate a change in size of an existing infestation. One aspect of documenting field data collection is to effectively document and archive the data for monitoring of the infestation. A well-managed database allows a weed manager to monitor infestation size over time and to determine if control treatments are being effective. A second aspect of documentation is to share the observation data across all members of a weed management area and within the ecoregion. Information sharing is the backbone of cooperative efforts toward weed management across a landscape and is an important component of strategic planning and policy development.

The SWEMP Team (the authors) have developed web based information and computer tools to help resource managers in the Southwest manage records of weed infestations, share that information through a regional database, and query the shared information on the web. These computer resources are part of many regional efforts in the Southwest to provide land managers, policy makers and the interested public with current information for weed management.

Organization of this Manual

This manual describes the following resources:

- Southwest Exotic Plant Information Clearinghouse (SWEPIC),
 - SWEPIC is a web site that has 310 weed information pages, lists of noxious weeds in the West (federal and state), the Alien Plant Ranking System information and downloads, and the Arizona Wildland Invasive Plants information and output
 - <http://www.usgs.nau.edu/SWEPIC/index.html>
- Southwest Exotic Mapping Program (SWEMP)
 - SWEMP is a USGS project that serves to compile contributed weed occurrence data from throughout the Southwest into a regional database, the SWEMP database

- Maps of the regional database are on SWEPIC. A query tool allows you to extract portions of the SWEMP database. Also, you can download the SWEMP database as a .dbf file.
- Southwest Weed Information Management System (SW-WIMS)
 - WIMS is a TNC desktop application (Microsoft Access) that can be used to store and manage information on infestations identified in the field
 - SW-WIMS is modifications of WIMS for use in the Southwest

This manual provides an overview of each of these resources. Fortunately, the overview is condensed and the detailed technical information is loaded in the appendices. You can view and download this entire manual or the appendices separately on SWEPIC. Follow the SWEMP, Download and Documents buttons.

We invite you to use these tools and to become a collaborator in the SWEMP regional database. We also invite you to provide any comments or feedback you might have to the SWEMP team and/or project leader. See “The SWEMP Team” section below for contact information.

The SWEMP Team

Questions and comments about the functioning of SWEPIC and SWEMP are welcome. You can send an e-mail to the SWEMP team or to Dr. Kathryn Thomas or Ryan Stevens, contacts below.

Project Leader	Kathryn Thomas Kathryn_A_Thomas@usgs.gov 928.556.7466 x235
Web services oversight	Ryan Stevens rmstevens@usgs.gov 928.556.7466 x250
CWMA mapping	Terry Arundel
Programming (2005)	Shannon Ruckauf
Data management (2005)	Heather Folger

Southwest Exotic Plant Information Clearinghouse (SWEPIC)

SWEPIC provides a regional portal for weed information in the Southwest. The USGS SWEMP Team developed it in partnership with the National Park Service, Northern Arizona University, Southwest Vegetation Management Association, University of Arizona Extension and The Nature Conservancy

Currently SWEPIC supports six features: Weed Species, Weed Lists, Maps, SWEMP, APRS and AZ-WIP. Each feature is accessed through a button on the SWEPIC home page.

SWEPIC Features

Weed Species

SWEPIC currently provides weed info pages for 310 plants in the Southwest, with 12 different information categories occurring on each weed information page, see Table 1.

Table 1. Information provided on each weed info page in SWEPIC.

Synonym	Other scientific names applied to the weed
Common Name	The USDA PLANTS Database common name for the weed (http://plants.usda.gov/) and/or Weeds of the West (Whitson et al., 2000) common name when different than the USDA PLANTS name
USDA Plant Code	The USDA Plants Database acronym for the weed
Family	The weeds' scientific family
Legal Listings	State Noxious Weed designations for the weed in Arizona, California, Nevada, New Mexico, Utah, and Colorado
CAL-IPC Category	The California Invasive Plant Council categorization for the weed
AZ-WIPWG Category	The joint California Invasive Plant Council/Southwest Vegetation Management Association criteria categorization for the weed and links to evaluation documentation.
National Ranking	Upcoming. National categorization for the weed.
Occurrence Map	Links to distribution maps for the species in the Southwest.
USDA Plants Database	Link to the weed information page on USDA Plants
Alien Plant Ranking System Locations	Locations for which the weed has been assessed using the APRS ranking and links to the assessment results.
More Web Information	Links to web sites providing biological, ecological, or management information about the weed, particularly as relates to the Southwest.
Fact sheets and other write ups	PDFs of select biological, ecological or management information for the weed.

Weed Lists

SWEPIC provides the state noxious weed lists for Arizona, California, Colorado, Nevada, New Mexico, and Utah as well as the USDA Federal Noxious Weed List.

Maps

SWEPIC provides its own interactive map server, the SWEMP IMS, for data in the SWEMP regional database. You can make a map of the most current SWEMP regional database or portions of it with a variety of backgrounds, including a map of Cooperative Weed Management Area boundaries. If you are unfamiliar with an IMS, need a refresher, or just want to see what is unique to the SWEMP IMS, Appendix A "Tips for Using the SWEMP IMS" provides useful detail. This document is also available at on the SWEPIC web site on the SWEMP, Downloads and Documents page.

SWEMP

SWEPIC is the main way in which the Southwest Exotic Plant Mapping Project (SWEMP) distributes data. See the SWEMP section below for information on the program and the tools on the web.

Alien Plant Ranking System (APRS)

APRS is a desktop application that helps land managers prioritize weed management based upon the level of impact expected at a site, the innate ability of the weed to be a pest, and its difficulty of control. The National Park Service (Hiebert and Stubbendieck 1993) developed the APRS software and asked the SWEMP team to make it available for download on SWEPIC. APRS databases generated for various locations are also available on SWEPIC, including the ratings given at the locations for the 23 APRS questions.

Arizona Wildlands Invasive Plants (AZ-WIP)

The Arizona Wildlands Invasive Plant Working Group (AZ-WIPWG), composed of volunteer representatives from over 15 organizations, applies the Cal-IPC/SWVMA Criteria for Categorizing Invasive Non-native Plants that Threaten Wildlands (the Criteria) to assess non-native plants that are established in natural areas. Through this state-wide risk assessment process, a non-regulatory list, the Arizona Wildlands Invasive Non-Native Plant List (the List), is being developed that categorizes plants according to their relative impacts on ecological processes, species, and native ecosystems. The web site supports information on the project, the documentation and categorization information of those species evaluated and information on how to work with the AZ-WIP group.

Southwest Exotic Plant Mapping Program (SWEMP)

The SWEMP team regularly compiles weed occurrence data provided by collaborators in the Southwest into the SWEMP regional database. You can be a collaborator with the project, be a user of the SWEMP regional database or be both! We invite you to collaborate and be part of the SWEMP program.

Collaborate with SWEMP

Who is a Collaborator?

A collaborator is any federal, state, tribal, county, non-governmental organization or private party that wishes to contribute weed occurrence data to the SWEMP regional database. SWEMP accepts data from collaborators within the arid Southwest, which is mainly composed of Arizona, New Mexico and adjacent areas in California, Nevada, Colorado, Utah and Sonora. Yes, we know that last sentence makes a rather fuzzy boundary. Maybe we will get it sorted out someday. The collaborator is responsible for the accuracy of the submitted data.

What to Collect

A list of weeds known to occur in the Southwest is in Appendix B (Table 3B, Non-native, Invasive Plants of Note in the Southwest). The list is from weeds submitted to SWEMP and from the Arizona Wildland Invasive Plant Group list of weeds to evaluate in Arizona. The list is not exclusive. If you believe that you have information about an infestation for a weed not currently on the list, please go ahead and submit it. Early observations are a vital component of information sharing and an emerging early detection and rapid response system in the Southwest.

How to Submit Data

There are four ways to submit data to SWEMP. We accept data:

- As an Excel spreadsheet or Access database sent to the SWEMP team,
 - Use Appendix B, “Guide to the SWEMP Data Dictionary” to guide you in working with your infestation data
- As an agency database shared with the SWEMP team,
 - The USGS SWEMP team will work with those agencies that have a central weed database to incorporate regional data into the SWEMP database. Please contact us if you wish to see your local information in the SWEMP database and that data can come from your agencies central weed database.
- As an export file from the SW-WIMS database manager
 - The SW-WIMS can be used as a desktop data manager. It provides a data export feature that you can use to extract data to be submitted to SWEMP. See the SW-WIMS section below for an overview and Appendix C “Tips for Using SW-WIMS” for technical information.
- As an entry on the SWEMP Data Entry page
 - Appendix D “Tips on Using the SWEMP Data Entry Tool”

The minimum data items that are required to submit data to SWEMP are:

- Collection_Date

- Scientific_Name OR USDA_Code
- GrossArea and CanopyCover OR Infested_Area
- Lat_Dec_Degrees (if submitted in UTM, the SWEMP team will convert)
- Long_Dec_Degrees (if submitted in UTM, the SWEMP team will convert)
- Datum
- State
- Source

We describe each of these fields in the SWEMP Data Dictionary (Appendix B). While we prefer to receive the submitted records formatted as described in the Data Dictionary, the SWEMP team will work with you if the records are formatted differently.

Use the SWEMP Database

There are three ways to view all or part of the SWEMP database:

- The SWEMP Interactive Map Server (IMS)
 - You can use the SWEMP IMS to design and print a map of weed occurrences from the SWEMP database.
 - The SWEMP IMS is on SWEPIIC; just follow the Map button.
 - Details on using the SWEMP IMS are in Appendix A, "Tips for Using the SWEMP IMS". This document is also at the SWEMP, Downloads and Documents pages on SWEPIIC.
- The Data Query Tool
 - You can use this the Data Query Tool to filter the SWEMP database by weed, land administrator, size of infestation or geographic boundary including by weed management area. The query results appear the screen and can be further queries record by record.
 - You can download the query results to an Excel file.
 - The tool is on SWEPIIC; follow the SWEMP, SWEMP Data Query buttons.
 - Details on using the SWEMP Data Query Tool are in Appendix E, "Tips for Using the SWEMP Data Query Tool". This document is also at the SWEMP, Downloads and Documents pages on SWEPIIC.
- A data download
 - The SWEMP database and metadata is available on SWEPIIC as a .dbf file that can be downloaded to your computer
 - Follow the SWEMP, Downloads and Documents buttons to get the data

Southwest - Weed Information Management System (SW-WIMS)

The Weed Information Management System is a desktop application developed by The Nature Conservancy (TNC) that provides the computer structure for weed managers to store, maintain, and manage weed infestation data. The USGS SWEMP team has made modifications to version 2.1b of the WIMS to make it more applicable to the arid Southwest.

The extensive TNC's Weed Information Management System (WIMS) *User's Manual*, can be downloaded at: <http://tncweeds.ucdavis.edu/wims.html>. The manual provides instructions on:

- How to enter data manually
- How to use a Pocket-PC or Palm-compatible personal digital assistant (PDA) handheld unit connected to a GPS.
- How to export data as an ESRI shapefile for use in ArcView and ArcPad;
- How to use the data to produce summary reports

The Southwest modifications to WIMS are not extensive, so the TNC User's Manual mostly applies. We have described the exceptions in Appendix C "Tips for Using the SW-WIMS".

TNC is planning an update of WIMS later in 2005. The SWEMP team will make every effort to provide updates to the new version and to make it available on the SWEPIC web site. The SWEMP team can provide advice about the use of WIMS but does not provide extensive user support. We have not used the handheld features of the data manager and cannot provide any evaluation on those features at this time. Please let us know how SW-WIMS works for you.

Appendices

Appendix A: Tips for Using the SWEMP IMS

Getting Started

An IMS is a way that a web user can do some basic GIS activities using data that are stored on another server. If you are new to GIS activities or need a review of how to navigate and use these tools in an IMS, we suggest you print out this help to use as a guide in exploring the SWEMP IMS.

This guide starts out by describing the features and basic concept of the SWEMP IMS and then gives examples specific to using the SWEMP IMS.

When you initially open the IMS, a **viewer** that looks like the screen below will appear. Don't worry if you see a dancing “nasty weed” beforehand; nasty weed dances every time a view is being generated and loaded. The time it will take to process a command will depend on your computer speed and Internet connection speed.

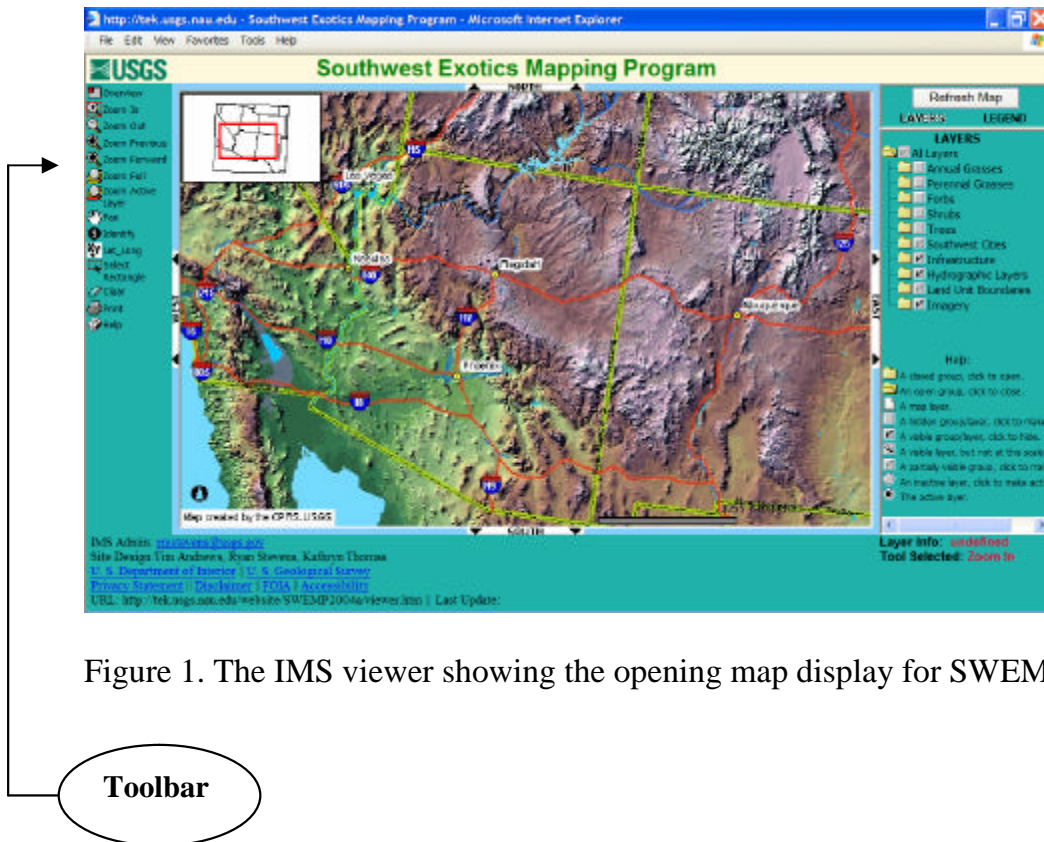



Figure 1. The IMS viewer showing the opening map display for SWEMP.


The IMS lets you create a map by putting one or more layers of information in the map display window. A layer represents a map or image of one sort of thing. It can be a reference layer such as a map of highways, or a satellite image. Or, the layer can be a thematic layer such as all the occurrences of a certain weed species. The IMS opens to a default map display with regional reference maps.


Basic Navigation


The toolbar on the left side of the map display provides the list of IMS tools you can use to manipulate and change the map in the display. You activate a tool by clicking on the icon with the left mouse button. For most tools, activating the icon enables the cursor to do a certain type of map function. In the lower left of the viewer, the tool you have selected shows after “Tool Selected”. For example in Figure 1, **Zoom In** is selected as indicated by the red box around the tool on the toolbar and in the legend on the lower right.


When you hold the cursor over each icon on the toolbar, a short annotation will appear on the screen reminding you what the tool does. A fuller explanation of each tool is below.

 **Overview:** This tool turns the overview map on or off. You don't see the overview map when it is off. When it is on the red box on the overview map will change to indicate the location shown on the map display.


 **Zoom In:** This tool lets you zoom in or magnify the map display. Go to the top left corner of the area that you want to zoom in on, hold the left mouse button down, and drag the cursor to make a box to the area to zoom in. The view will redraw to this new area. You can repeat the process to zoom in even more. Another way to do this is to activate the tool by clicking it, and then moving it to and clicking it on a location on the map view. Each repetition zooms in by a factor of 2X. The IMS is set up so that when you have zoomed in so that the scale is 1:25,000 or smaller, a new set of reference layers will appear in the background.


 **Zoom Out:** This tool lets you zoom out or shrink the map display. It operates in just the opposite way as **Zoom In** described above.


 **Zoom Previous:** This tool let's you backup to a previous version of your map display. If you have done a series of **Zoom In** or **Zoom Out** commands, use **Zoom Previous** to back up through the versions.

 **Zoom Forward:** This tool lets you go forward once you have gone backwards through versions of a map display. This tool is used in conjunction with **Zoom Previous**.


 **Full Extent:** This tool takes the map back to the very original map display.


 **Zoom Active Layer:** This tool lets you show all occurrences or the entire extent of the active layer.

 **Pan:** This tool lets you move around the map view. Click on the tool icon, place your cursor on the map, hold down the left mouse button, and then drag the view in a direction that will bring onto the view the desired new areas. Release the mouse. The view will redraw automatically when you release the mouse.


 **Identify:** This tool lets you click on an active feature on the map display to see the database information associated with the site. Line up the cursor on the feature and click your left mouse. The information will appear in the window to the right of the map.

Lat/Long: (Unproject) Activate this tool and click on a map display feature to get a pop up window with the features' longitude and latitude coordinates in decimal degrees.

 **Select Rectangle:** Click on this tool and draw a box around map display features for which you want available database information. A pop-up window returns.

 **Clear:** Click on this tool to clear features selected with Select.

 **Print:** Click on this tool to create a printable map layout, with legend, of the map display. See Using the SWEMP IMS under Help for detailed instructions.

 **Help:** A short version of the toolbar functions pops up.

Making and exploring a map display

The IMS provides a variety of choices for constructing a particular map view. The right hand area of the viewer, to the right of the map display, is where the choices are made as to which layers go into a map view. The right hand area has two modes, “Layer” and “Legend.” To make choices about a map display, be sure the “Layer” view is on. If not, click the word “Layer” at the top of this area.

Some terminology is important:

Group: This is a collection of layers with commonality, such as a group of infrastructure layers. The SWEMP IMS has so many layers that we needed to group them, such as a file folder would group a set of similar documents. Groups are either closed or open. When they are open, the icon looks like an open file folder and you will see a list of all layers in the group on the right of the map view. Click on the group icon to open the group.

Visible: Layers do not show up on the map unless you have checked them to be visible. Click on the square box next to the layer name to make that layer appear on the map view. All layers in a group can be made active by checking the box next to the group name. Some layers, intended for background, only show up at certain scales.

Active: A layer may show up on the map but you cannot query it unless it is active. Only one layer is active at a time. Check the round box next to the layer you want to be active. Also, the layer that is active is indicated on the lower right at “Layer Info”.

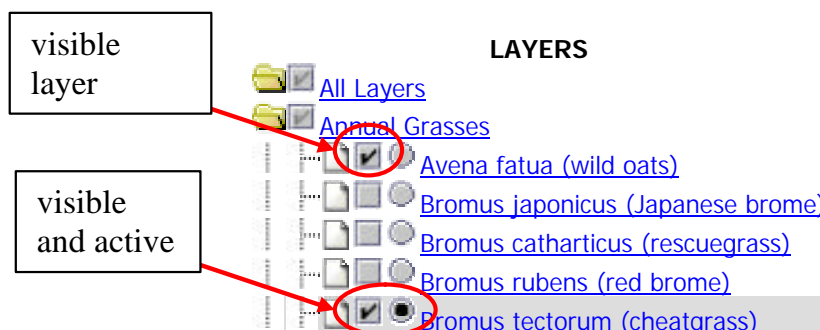


Figure 2. An example of part of the layers index on the right side of the viewer; this small section shows an open group with two visible thematic layers, one of which is also active.

Choices that you can make for each map display are the scale, the reference layers, and the thematic layers. The thematic layers for SWEMP are the layers of each weed species in the current SWEMP regional database. The layers are grouped by lifeform: annual grasses, perennial grasses, forbs, shrubs or trees. When you open up a group, you will see the list of weed layers by scientific name.

You can make multiple versions of a map display. “Zoom In” and “Zoom Out” change the scale. To chose the reference and thematic layers, open up a group and making the desired layers visible. You can choose all the layers in a group by clicking on the square box next to the group name.

Note: Every time you select and make visible a new set of layers and or change the active status of a layer, the map display has to be refreshed for the new layer configuration to show. Clicking the Refresh Map button in the upper right does this. After the “nasty weed” does it dance, while the map redraws, you will see your newly designed map display.

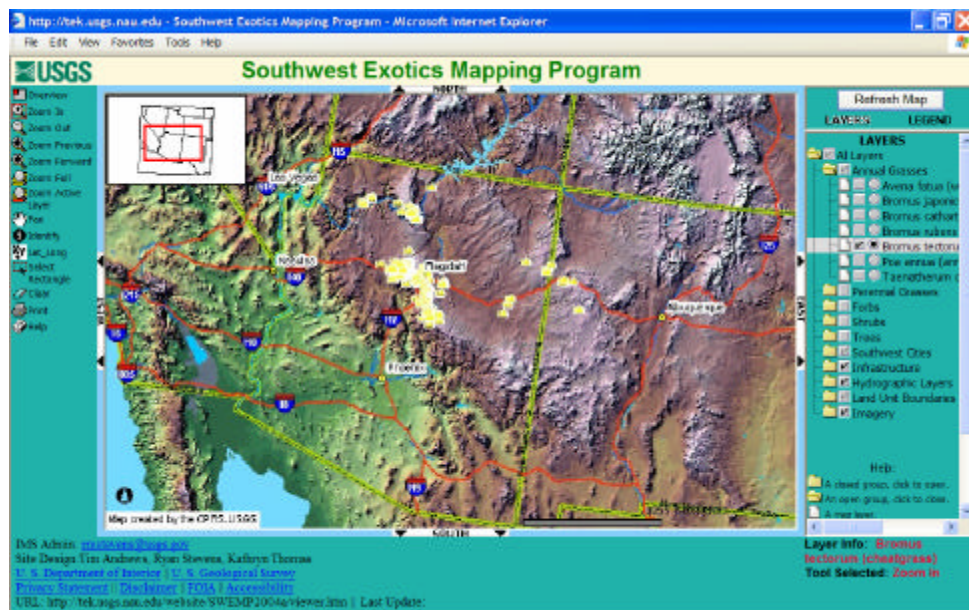


Figure 3. A map display of all *Bromus tectorum* occurrences in the SWEMP 2003 database. All the default reference layers have been maintained.

Examples of common SWEMP IMS activities

A) I want to see all occurrences of a particular weed.

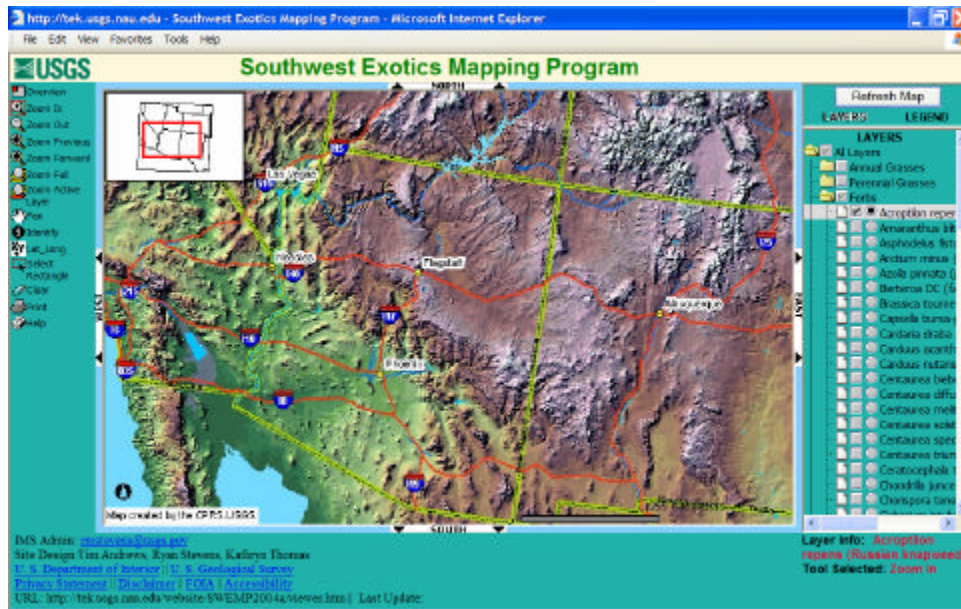


Figure 4a. In the example *Acroptilon repens* has been chosen to be both visible (square box) and active (circular box). The lower right hand legend shows that it is the active layer.

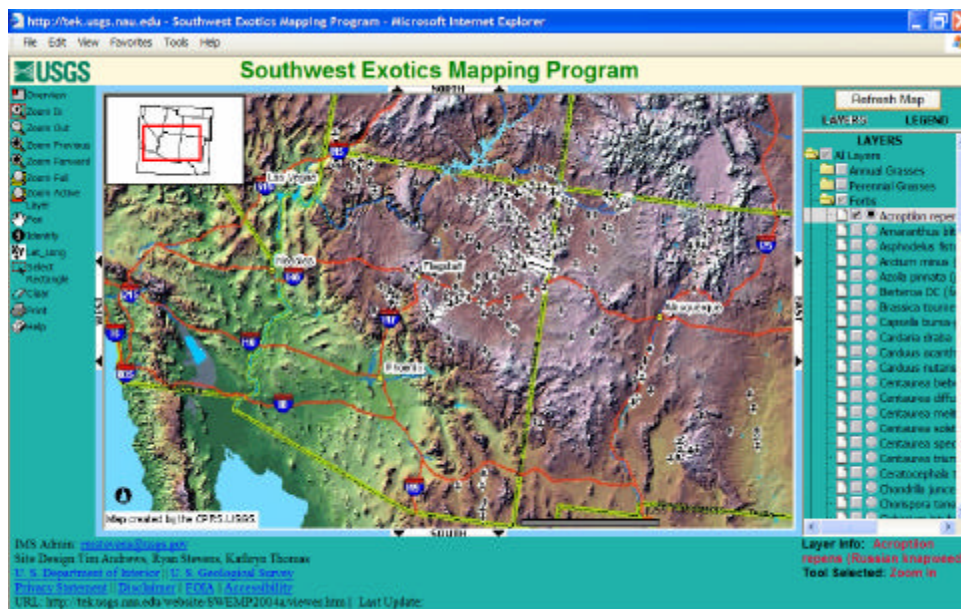


Figure 4b. The Refresh Map button has been clicked with the mouse so that *Acroptilon repens* occurrences show.

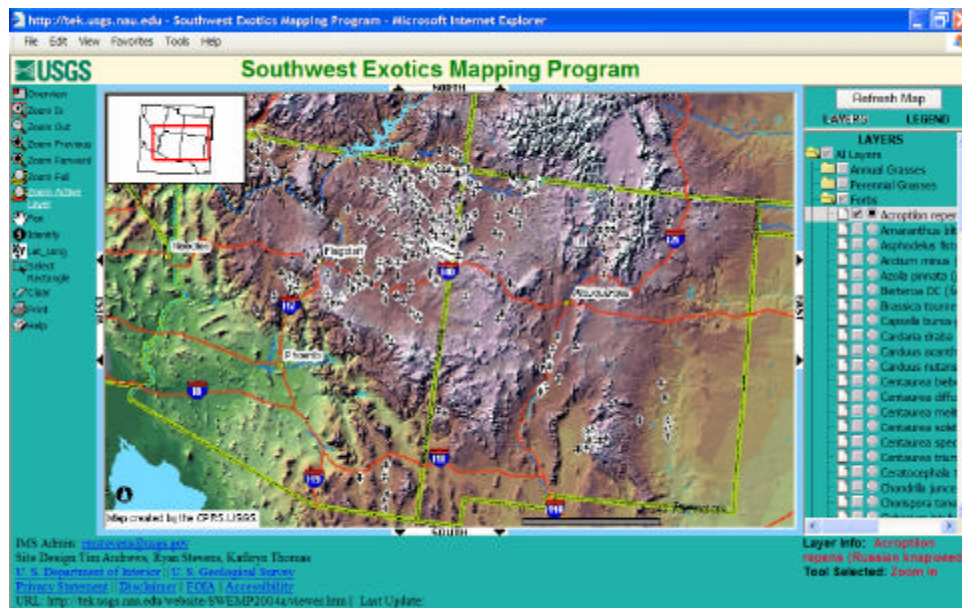


Figure 4c. The Zoom Active button was clicked to position the map display so that it shows the best placement for all the occurrences of *Acroptilon repens*.

- B) I want to print a map of this weed but I want to change the background first (continuing on example from example A, above).

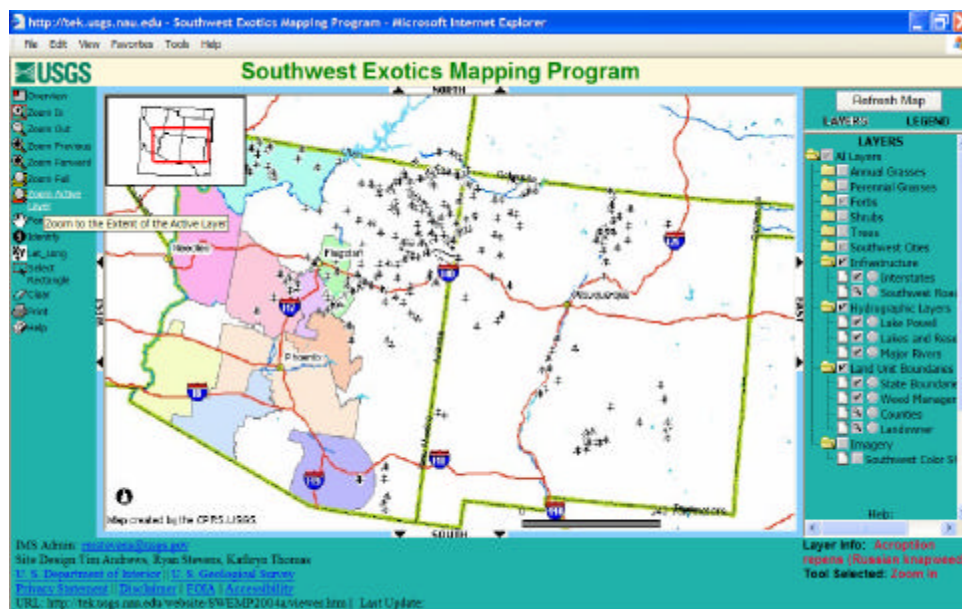


Figure 5a. The imagery background has been unactivated (unchecked box). The weed management area layer has been activated. Some reference layers can not be activated until the map display has been zoomed in to at least 1:25,000). A magnifying glass icon in the visible layer box indicates this.

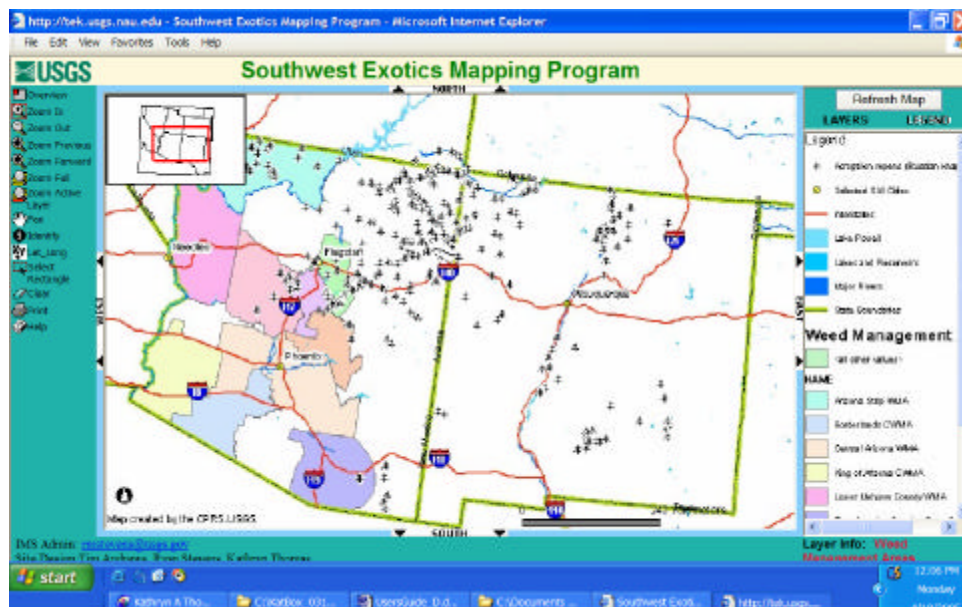


Figure 5b. The Legend text was clicked to change the information to the right of the map display from the layers index to a legend.

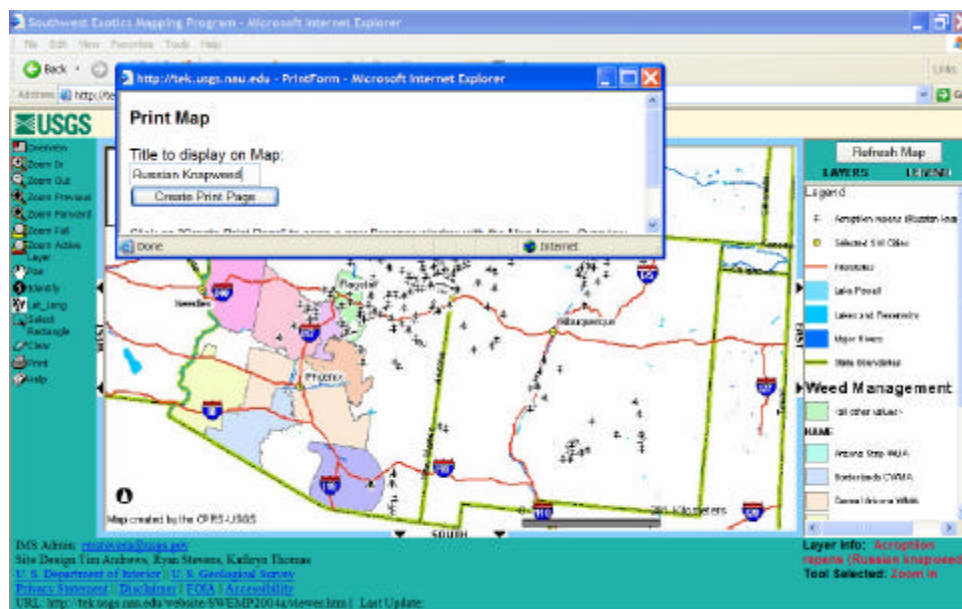


Figure 5c. The Print tool was activated. The pop-up window displayed has an area in which a title can be assigned to the map. In this example, the map is named Russian Knapweed. Next the Create Print Page button is clicked.

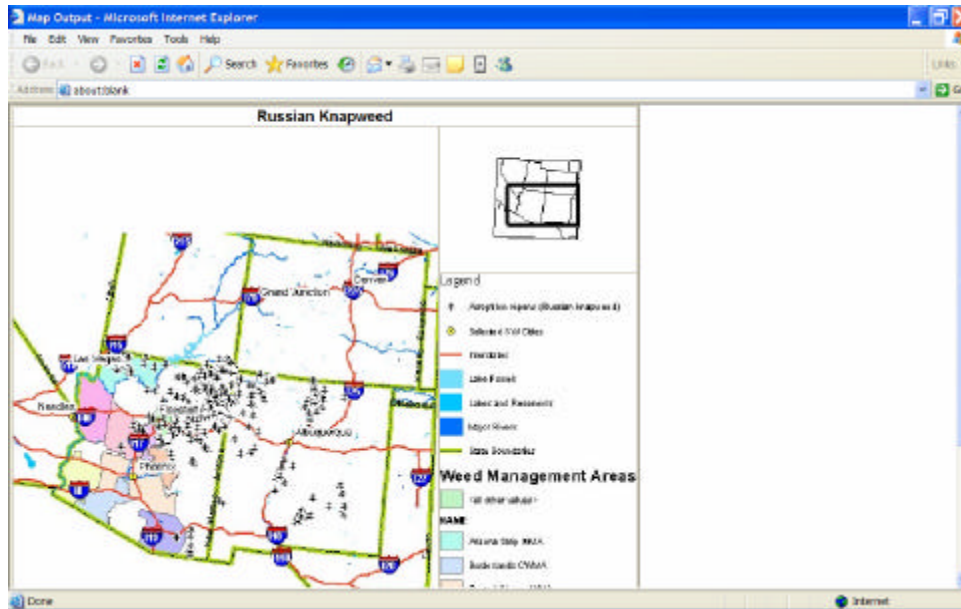


Figure 5d. The screen will show the map graphic that you have created. You can now either print the map or go back some steps and make changes in the map design.

C. I want to know more about a weed occurrence.

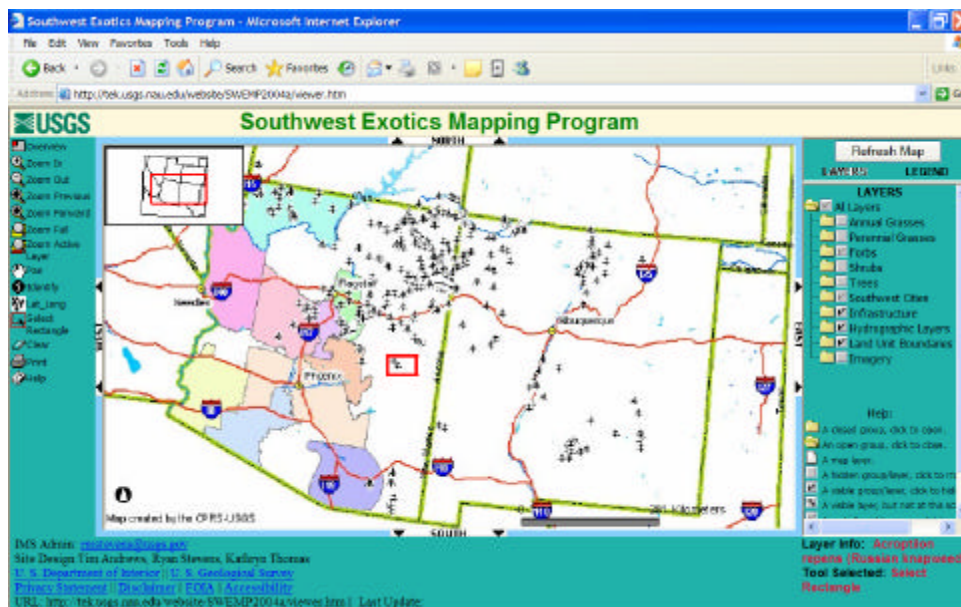


Figure 6a. There are two ways to get database information about weed record(s). In this example the Select Rectangle tool was used to select two weed records (red box). Alternatively the identify tool could have been selected to click on one weed record.

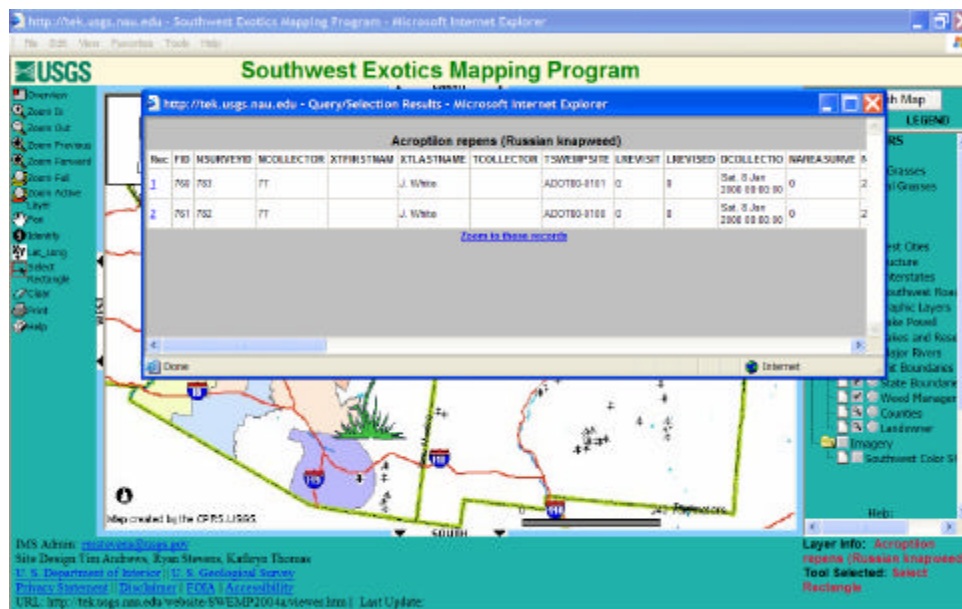


Figure 6b. The SWEMP database records for the selected weed occurrences appear on the screen. You can scroll across to see all data items.

Appendix B: Guide to the SWEMP Database

This guide can be used by collaborators who are submitting weed occurrence data using an excel or Access file to help format their submitted data. We recommend reading the Southwest Exotic Plant Mapping Program section in the User's Guide. This guide also describes the data fields for users of the SWEMP database.

Important database terminology

Record: The rows indicate records, or the actual information recorded for each weed occurrence.

Data type: In a database, such as Excel or Access, each field holds a type of data, for example, text, number, date. The data type, along with the field size, indicates the database structure.

Field: The columns identify fields, each one of which is a particular type of information about a weed occurrence.

Field size: In database software such Access each field is a certain size. The field size, along with the database type, indicates the database structure.

Flat file: A flat file is a database that shows rows and columns. The SWEMP team maintains the database as a relational database (many tables related to each other through

a common identification number) but distributes the data as a flat file. Collaborators that send the team data usually do so with a flat file. A flat file has rows and columns.

Structure: The data type and field size for any field.

How to Collaborate

The minimum data fields required to submit data to the SWEMP regional database are:

- Collection_Date
- Scientific_Name OR USDA_Code
- GrossArea and CanopyCover OR Infested_Area
- Lat_Dec_Degrees (if in UTM SWEMP will convert)
- Long_Dec_Degrees (if in UTM SWEMP will convert)
- Datum
- State
- Source

Each of these fields is described below in the Database Fields section. If a collaborator does not provide the GrossArea and CanopyCover or Infested_Area, SWEMP will enter the occurrence record area as "No Data." If a collaborator does not provide the size data SWEMP will still enter the location records and indicate no data provided on the size of infestation. While we prefer to receive the submitted records formatted as described below, we will work with you if they are not.

Database Fields

The fields contained in the SWEMP regional database follow the North American Weed Management Association's North American Invasive Plant Mapping Standards (<http://www.nawma.org/>) as closely as possible. The list below shows all fields, alphabetically, in the compiled database with the field structure (database type and size) in parenthesis following the field name. You will notice that the SWEMP team changes some contributed data fields from what a collaborator submits as part of compiling the data into the regional database. After the 2004 update, we kept an archive record of the original field entries contributed by each collaborator.

AquaWeedManArea (Text, 50)

Collaborator: The collaborator does not provide these data.

SWEMP: The SWEMP team provides this information.

Description: The AquaWeedManArea indicates in which aquatic weed management area a weed occurrence is located. The SWEMP team assigns this field using the most current weed management area map that the team has. A weed occurrence may occur in one or more aquatic weed management areas as well as a cooperative weed management area.

Example: Aquatic WMA & Lower Colorado Giant Salvia

CanopyCover (Text, 25)

Collaborator: The collaborator submits these data if GrossArea (see below) is provided.

SWEMP: No further processing.

Description: The CanopyCover field represents the percent canopy cover of the weed within a delineated GrossArea. If there is more than one weed in the GrossArea, then estimate the cover for each weed separately. SWEMP defers to the NAWMA definition for CanopyCover "[Canopy cover is]... estimated as a percent of the ground, covered by foliage of a particular weed species." The SWEMP team converts all submitted data to categories, see table 1A below. If the GrossArea and CanopyCover or Infested_Area are not provided, SWEMP will enter the occurrence record area as "No Data".

Table 1A. Categories for CanopyCover (Percent)

<1
1-5
>5-25
>25-100

Example: Collaborator submits a CanopyCover of 3%; SWEMP team converts this to 1-5 for the regional database.

Common_Name (Text, 50)

Collaborator: The collaborator does not need to provide this information; however, if the data are provided, use the list of common names provided in Table 3B (following the USDA_Code description).

SWEMP: SWEMP provides the common names. SWEMP uses the Weeds of the West (2000) as the first source for common names and then the USDA PLANTS database. Table 3B shows the USDA PLANT code and scientific and common names SWEMP currently uses.

Example: perennial pepperweed

Control (Text, 150)

Collaborator: The collaborator provides this information.

SWEMP: No further processing.

Description: This field indicates whether the weed occurrence was treated. Choose from the following and enter all that apply: No Action, Biological, Cultural, Herbicide, or Mechanical.

Example: The weed was pulled. “Mechanical” is entered.

COOPWeedManArea (Text,100)

Collaborator: The collaborator does not provide these data.

SWEMP: The SWEMP team provides this information.

Description: The COOPWeedManArea indicates in which weed management area a weed occurrence is located. The SWEMP team assigns this field using the most current weed management area map that the team has. However, SWEMP will add new weed management areas to the map and the database will be updated as the SWEMP team receives information.

Example: Arizona Strip WMA

Country (Text, 50)

Collaborator: The collaborator should supply this information if the weed occurrence is in Mexico.

SWEMP: The SWEMP team will assume the country to be the United States (US) unless the collaborator indicates otherwise.

Description: Identifies the country where the weed occurrence is located. To date, all entries have been from the US but SWEMP will incorporate entries from Sonora, Mexico.

Example: US

County (Text, 50)

Collaborator: The collaborator should provide this information.

SWEMP: The team provides a quality check by overlaying submitted locations on a county map in a GIS.

Description: County is the county where the weed occurrence is located.

Example: Pima

Collection_Date (Date, yyyymmdd)

Collaborator: The collaborator is required to submit this information.

SWEMP: No further processing.

Description: This field indicates the date of the observation. Enter the date in the format of year, month, day (yyyymmdd). If the exact day of the month is not known, use 01 for the day of the month.

Example: 20031022. The observation was made October 22, 2003.

Datum (Text, 6)

Collaborator: The collaborator provides the datum in which the data are collected. SWEMP will accept data in NAD27, NAD83 or WGS83.

SWEMP: The team converts all data submitted to a standard datum.

Description: The geodetic datum defines the size and shape of the earth and the origin and orientation of the coordinate system used to map the earth.

Example: NAD27

Examiner (Text, 150)

Collaborator: The collaborator should provide this information although it is not required.

SWEMP: No further processing.

Description: This field represents the individual(s) who collected the field data. The Examiner is entered in the format of first initial, full last name

Example: K. Thomas

Genus (Text, 50)

Collaborator: The collaborator provides the Genus AND Species OR Scientific_Name OR USDA_Code. See Table 3B (following the USDA_Code description).

SWEMP: The team will make sure the currently accepted scientific name for the weed is applied. See Scientific_Name for more information.

Example: *Lepidium*

GrossArea (Text, 50)

Collaborator: The collaborator provides both the GrossArea AND CanopyCover OR the Infested_Area (described below) for each species at the site. The unit of measure is acres.

SWEMP: The team converts all data provided to categories, see table 2B below. The team will add more categories above >5.1 if data is submitted to support more categories.

Description: GrossArea describes the approximate size of the occurrence in acres. If the weed is searched for but is absent, enter "Absent". SWEMP defers to the NAWMA definition for GrossArea: [GrossArea] is intended to show general location and population information. Like Infested Area it is the area of land occupied by a weed species. Unlike Infested Area, the area is defined by drawing a line around the general perimeter of the infestation not the canopy cover of the plants. The gross area may contain significant parcels of land not occupied by weeds.

Gross area is used in describing large infestations. When a value is entered for gross area, the assumption is that the area within the perimeter of the weed population (area perimeter) is an estimate or the product of calculating the area within a described perimeter." SWEMP multiplies GrossArea by CanopyCover to determine Infested_Area. If the GrossArea and CanopyCover or Infested_Area is not provided, SWEMP will enter the occurrence record area as "No Data'.

Table 2B. SWEMP Categories for GrossArea

Absent
< 0.1
0.1 to <=1
1.1 to <=5
>5.1

Example: Collaborator submits .3 acres; SWEMP team converts to 01. to <=1 acres.

Infested_Area (Text, 50)

Collaborator: The collaborator provides the Infested_Area OR both the GrossArea and CanopyCover for each species at the site.

SWEMP: If the collaborator does not provide Infested_Area, SWEMP calculates it as GrossArea multiplied by CanopyCover, using either the field data or the midpoints of the categories if that is not possible. The unit of measure is acres.

Description: Infested_Area is the approximate area in acres of the invasive species. An infested area of land is defined by drawing a line around the actual perimeter of the site as defined by the canopy cover of the weeds, excluding areas not infested. SWEMP defers to the NAWMA definition for Infested_Area: "Area of land containing one or

more weed species. An infested area of land is defined by drawing a line around the actual perimeter of the infestation as defined by the canopy cover of the plants, excluding areas not infested. Areas containing only occasional weed plants per acre do not equal one acre infested. Generally, the smallest area of infestation mapped will be 1/10th (.10) of an acre or 0.04 hectares." If the GrossArea and CanopyCover or Infested_Area are not provided, SWEMP will enter the occurrence record area as "No Data."

Example: <0.1

Table 2B. SWEMP Categories for Infested Area (acres)

Absent

< 0.1

0.1 to <=1

1.1 to <=5

>5.1

Lat_Dec_Degrees (Number, double)

Collaborator: The collaborator provides either the latitude or the northing (a UTM coordinate) of the location at which the weed occurs. Please provide the zone if a UTM coordinate is used. The preferred format is latitude in decimal degrees.

SWEMP: The team converts any coordinates submitted as a northing or latitude in degrees, minutes, seconds to decimal degrees latitude.

Description: Lat_Dec_Degrees is the latitude coordinates in decimal degrees.

Example: 36.85902

Local_Owner (Text, 100)

Collaborator: The collaborator should provide this information

SWEMP: The SWEMP team provides a quality check of the submitted data or adds this information using the SWReGAP land stewardship maps for the Southwest states. See Table 4B (at end of appendix).

Description: This describes the specific land administrator for the location of the weed occurrence. The list of local owners currently designated is shown in Table 4B. It is important to identify all private land records. The SWEMP team will assume that the collaborator has the proper permissions to record data from private land. To further insure privacy rights, all records identified as private land by the collaborator or by a secondary check by the SWEMP team using the SWReGAP land stewardship maps will have their location coordinates degraded by 1000 meters such that the coordinates for the occurrence are only correct within a kilometer of the infestation.

Example: Petrified Forest National Park

Long_Dec_Degrees (Number, double)

Collaborator: The collaborator provides either the longitude or the easting of the location at which the weed occurs. Please provide the zone if a UTM coordinate is used. The preferred format is longitude in decimal degrees.

SWEMP: The team converts any coordinates submitted as an easting (a UTM coordinate) or longitude in degrees, minutes, and seconds to decimal degrees longitude.

Description: Long_Dec_Degrees is the longitude coordinates in decimal degrees.

Example: -111.60088

National_Owner (Text, 100)

Collaborator: The collaborators should provide this information.

Requirement: The team provides a quality check or adds this information using the SWReGAP land stewardship maps for the Southwest states. See Table 5B (at end of appendix).

Description: The National_Owner field identifies the type of land where the occurrence is located. The list of national owners currently designated is shown in Table 5B. SWEMP will add additional national owners if necessary.

Example: National Park Service

Notes (Memo)

Collaborator: No notes are expected, but can be included for a record if some information should be included in the SWEMP regional compilation.

SWEMP: The team adds notes to a record when we have revised a record or there is some other important annotation.

Description: This field contains important information that is pertinent to the site record.

Example: For a weed occurrence believed to have been collected on private land the note reads "Latitude and longitude on private lands are degraded to 2 digits after decimal."

Revised? (Logical, Yes/No)

Collaborator: If the collaborator has discovered a mistake in the record as it appears in SWEMP, they should contact the SWEMP team and discuss the need to correct the record.

SWEMP: The team will make corrections as needed.

Description: The team will make corrections in the database as appropriate in the next edition of the SWEMP database. The Notes field will indicate who requested the change and when the SWEMP team implemented it.

Example: It was determined that a previously submitted record showed the wrong species identification. The collaborator contacted SWEMP and the record was changed. The NOTES field documents this: "9-10-03 changed from LIVU2 to LIDA per K.Thomas & L. Moser"

Revisit? (Logical, Yes/No)

Collaborator: The collaborator provides this information

SWEMP: The SWEMP team assumes that the occurrence record is new unless the collaborator indicates that the record is a revisit. Beginning in 2005 the team will conduct a spatial proximity check, as described below, and adjust the Revisit status as needed.

Description: Enter "Yes" if this is a revisit or "No" if it is not. A revisit is when a land manager initially records and treats a specific site, and then later returns to the site to assess the effectiveness of the treatment or the land manager returns another year to examine changes in the weed occurrence. Beginning with the SWEMP2005 compilation, the SWEMP team does check for any occurrence records occurring within 50 meters of a previous record and will consider a record for a subsequent year to be a revisit regardless of who initially submitted the record.

Scientific _Name (Text, 100)

Collaborator: The collaborator provides the Scientific_Name OR USDA_Code OR both Genus AND Species. See Table 3B (following the USDA_Code description).

SWEMP: The team will make sure the currently accepted scientific name for the weed is applied.

Description: SWEMP uses the USDAPLANTS database (<http://plants.usda.gov/>) as the authority for weed synonymy for the plant scientific name (genus, species and variety and subspecies, if applicable). If a weed occurrence is submitted using nomenclature that has been revised or not yet accepted, we will defer to the USA PLANTS database unless there is some compelling reason not to. In that case, we will explain the deviation in the Notes area of the database. Table 3B shows the USDA PLANT code and scientific and

common names SWEMP currently uses. A newly found non-native, invasive may be added to the database, so Table 3B list is not exclusive.

Example: *Lepidium latifolium*

Species (Text, 50)

Collaborator: The collaborator provides both Genus AND Species OR Scientific_Name OR USDA_Code. See Table 3B (following the USDA_Code description).

SWEMP: The team will make sure the currently accepted scientific name for the weed is applied. See Scientific_Name for more information.

Example: *latifolium*

SWEMP_Site_Code (Text, 15)

Collaborator: The collaborator can use this site-naming scheme if the SWEMP team has provided them a “collaborator code.” The collaborator can also use their own site-naming scheme.

SWEMP: The team will assign this site-naming scheme to each location if the collaborator has not.

Description: SWEMP_Site_Code is a unique identifier for each geographic site where a weed occurs. There may be one or many weed species at the location; hence, more than one record may have the same site number. The first four letters of SWEMP_Site_Code is an abbreviation of the collaborating entity. If you do not have an abbreviation already assigned, please e-mail the SWEMP project leader to get a unique collaborator code. The collaborator code is followed by a two-digit year suffix indicating the year the data is submitted to SWEMP (records prior to 2005 may not be consistent on the year format). The second half of the code is a sequential number, following a hyphen, assigned to each location and consists of four numbers beginning with 0001. If there are multiple weeds at a site (within a 100 meter radius), each weed will be a separate record but will have same site number.

Example: TEST03-0001. The first half of the number (TEST03) will remain the same for all of 2003. However, each occurrence will have a new site code, which is assigned sequentially (0001, 0002, 0003, etc.).

Example: LIDA, ACRE, and ALMA are all present within a 100 meter radius and the site code is BLM03-0001, then all three species will have the same SiteNumber. However, each will have an independent record since the data for other fields may be different.

State (Text, 3)

Collaborator: The collaborator provides the state in which the observation occurs.

SWEMP: The team provides a quality check by overlaying submitted locations on a state map in a GIS.

Description: State is where the physical location of the weed occurrence is located. The states included in the SWEMP database and the acronyms preferred are Arizona (AZ), California (CA), Colorado (CO), New Mexico (NM), Utah (UT), and Sonora (SO).

Example: AZ

Source (Text, 50)

Collaborator: The collaborator must provide this information.

SWEMP: The team maintains the collaborator contact information for record documentation; only the collaborator's name appears in the database.

Description: This field identifies the owner or manager of the data, in other words the person who is taking responsibility for the data. This may be a different person or entity from the landowner or the person who collected the data (see Examiner, above). In case the SWEMP team or a user of the database has a question about the weed occurrence record, the Source field indicates the person to contact. Only the name of the Source is displayed in the regional database. For each Source SWEMP maintains information on the Source identity: affiliation, e-mail address, telephone.

Example: Kathryn Thomas

USDA_Code (Text, 10)

Collaborator: The collaborator provides the USDA_Code OR both Genus AND Species OR Scientific_Name.

SWEMP: The team will make sure the currently accepted USDA PLANTS code for the weed is applied.

Description: This field indicates the USDA PLANT database code for the weed. The four-character codes are found at <http://plants.usda.gov/>. Table 3B “Non-native Invasive Plants of Note in the Southwest (below); also shows the USDA PLANT code and scientific and common names SWEMP currently uses. A newly found non-native, invasive may be added to the database, so the list is not exclusive.

Example: LELA2 (The USDA PLANTS code for *Lepidium latifolium*).

Table 3B. Non-native, Invasive Plants of Note in the Southwest

USDA_Code	Genus	Species	Common Name
ACBR5	Achnatherum	brachychaetum	shortbristled needlegrass
ACRE3	Acroptilon	repens	Russian knapweed
AECY	Aegilops	cylindrica	jointed goatgrass
AGDE2	Agropyron	desertorum	desert wheatgrass
AGST2	Agrostis	stolonifera	creeping bentgrass
AIAL	Ailanthus	altissima	tree of heaven
ALMA12	Alhagi	maurorum	camelthorn
ALPH	Alternanthera	philoxeroides	alligatorweed
ALVE2	Aloe	vera	Barbados aloe
AMBL	Amaranthus	blitoides	mat amaranth
ARDO4	Arundo	donax	giant reed
ARM12	Arctium	minus	lesser burdock
ASFI2	Asphodelus	fistulosus	onionweed
AVFA	Avena	fatua	wild oats
AZPI	Azolla	pinnata	pinnate mosquitofern
BEIN2	Berteroa	incana	hoary false madwort
BERTE	Berteroa	species	false madwort
BRCA6	Bromus	catharticus	rescuegrass
BRIN2	Bromus	inermis	smooth brome
BRJA	Bromus	japonicus	Japanese brome
BRR18	Bromus	rigidus	ripgut brome
BRRU2	Bromus	rubens	red brome
BRTE	Bromus	tectorum	cheatgrass
BRT0	Brassica	tournefortii	African mustard
CAAC	Carduus	acanthoides	plumeless thistle
CABU2	Capsella	bursa-pastoris	shepherd's purse
CACH10	Cardaria	chalapensis	lenspod whitetop
CADR	Cardaria	draba	whitetop
CANU4	Carduus	nutans	musk thistle
CAPU6	Cardaria	pubescens	hairy whitetop
CEBI2	Centaurea	biebersteinii	spotted knapweed
CEDI3	Centaurea	diffusa	diffuse knapweed
CEIB	Centaurea	iberica	Iberian knapweed
CEME2	Centaurea	melitensis	Malta starthistle
CENTA	Centaurea	species	knapweed
CESO3	Centaurea	solstitialis	yellow starthistle
CESU	Centaurea	sulphurea	sulphur knapweed
CETE5	Ceratocephala	testiculata	curveseed butterwort
CETR8	Centaurea	triumfettii	squarrose knapweed
CHJU	Chondrilla	junceae	hogbite
CHMU2	Chenopodium	murale	nettleleaf goosefoot
CHTE	Chloris	texensis	Texas windmill grass
CHTE2	Chorispora	tenella	crossflower
CIAR4	Cirsium	arvense	Canada thistle
CIIN	Cichorium	intybus	chicory
CIVU	Cirsium	vulgare	bull thistle
COAR4	Convolvulus	arvensis	field bindweed

CODI6	Coronopus	didymus	lesser swinecress
COMA2	Conium	maculatum	poison hemlock
COSE4	Cortaderia	selloana	Uruguayan pampas grass
COSQ	Coronopus	squamatus	greater swinecress
CUME	Cucumis	melo	cantaloupe
CYDA	Cynodon	dactylon	Bermudagrass
CYES	Cyperus	esculentus	yellow nutsedge
CYOF	Cynoglossum	officinale	gypsyflower
DAGL	Dactylis	glomerata	orchardgrass
DESO2	Descurainia	sophia	herb sophia
DIFU2	Dipsacus	fullonum	common teasel
DRAR7	Drymaria	arenarioides	sandwort drymary
ECCO2	Echinochloa	colona	junglerice
ECCR	Echinochloa	crus-galli	barnyard grass
EGDE	Egeria	densa	Brazilian waterweed
EICR	Eichhornia	crassipes	floating water hyacinth
ELAN	Elaeagnus	angustifolia	Russian olive
ELRE4	Elymus	repens	quackgrass
ENMO	Enneapogon	mollis	soft feather pappusgrass
ERC1	Eragrostis	cilianensis	stinkgrass
ERC16	Erodium	cicutarium	redstem stork's bill
ERCU2	Eragrostis	curvula	weeping lovegrass
ERLE	Eragrostis	lehmanniana	Lehmann lovegrass
ERRE4	Erysimum	repandum	spreading wallflower
ERSU	Eragrostis	superba	Wilman lovegrass
ERVES	Eruca	vesicaria ssp. Sativa	garden rocket
EUES	Euphorbia	esula	leafy spurge
EUSUx	Euyrops	subcarnosus ssp vulgaris	sweet resinbush
HAGL	Halogeton	glomeratus	halogeton
HEC1	Helianthus	ciliaris	Texas blueweed
HEHE	Hedera	helix	English ivy
HIIN3	Hirschfeldia	incana	shortpod mustard
HOMU	Hordeum	murinum	mouse barley
HYNI	Hyoscyamus	niger	black henbane
HYPE	Hypericum	perforatum	common St. Johnswort
HYVE3	Hydrilla	verticillata	hydrilla
IPHE	Ipomoea	hederacea	ivyleaf morningglory
IPPU2	Ipomoea	purpurea	tall morningglory
IPTR3	Ipomoea	tricolor	multicolored morningglory
ISTI	Isatis	tinctoria	Dyer's woad
KOSC	Kochia	scoparia	kochia
LACA2	Lantana	camara	lantana
LARE	Lappula	redowskii auct. non	flatspine stickseed
LASE	Lactuca	serriola	prickly lettuce
LECA5	Lepidium	campestre	field pepperweed
LELA2	Lepidium	latifolium	perennial pepperweed
LEPE2	Lepidium	perfoliatum	clasping pepperweed
LEVU	Leucanthemum	vulgare	oxeye daisy
LIDA	Linaria	dalmatica	dalmatian toadflax
LIVU2	Linaria	vulgaris	common toadflax

LOAR10	Lolium	arundinaceum	tall fescue
LOPE	Lolium	perenne	perennial ryegrass
LYSA2	Lythrum	salicaria	purple loosestrife
MAAF	Malcolmia	africana	Malcolm stock
MALO3	Matthiola	longipetala	night scented stock
MANE	Malva	neglecta	common mallow
MAPA5	Malva	parviflora	little mallow
MAVA	Manfreda	variegata	mottled tuberose
MAVU	Marrubium	vulgare	horehound
MEAL12	Melilotus	alba	white sweetclover
MECR3	Mesembryanthemum	crystallinum	common iceplant
MEIN2	Melilotus	indicus	annual yellow sweetclover
MELU	Medicago	lupulina	black medick
MEMI	Medicago	minima	little burclover
MENO2	Mesembryanthemum	nodiflorum	slenderleaf iceplant
MEOF	Melilotus	officinalis	yellow sweetclover
MEPO3	Medicago	polymorpha	California burclover
MERE9	Melinis	repens	rose Natal grass
MYAQ2	Myriophyllum	aquaticum	parrotfeather
MYS2	Myriophyllum	spicatum	spike watermilfoil
NATR3	Nassella	trichotoma	serrated tussock grass
NEOL	Nerium	oleander	oleander
ONAC	Onopordum	acanthium	Scotch cottonthistle
PAAN4	Panicum	antidotale	blue panicum
PADI3	Paspalum	dilatatum	dallisgrass
PAGL17	Packera	glabella	butterweed
PECI	Pennisetum	ciliare	buffelgrass
PEHA	Peganum	harmala	African rue
PEIN4	Pentzia	incana	African sheepbush
PESE3	Pennisetum	setaceum	fountaingrass
PEVI2	Pennisetum	villosum	feathertop
PHPR3	Phleum	pratense	timothy
PLMA	Plantago	macrocarpa	seashore plantain
POAN	Poa	annua	annual bluegrass
POAV	Polygonum	aviculare	prostrate knotweed
POBU	Poa	bulbosa	bulbous bluegrass
POCO	Poa	compressa	Canada bluegrass
POCR3	Potamogeton	crispus	curly pondweed
POMO5	Polypogon	monspeliensis	rabbitfoot ployogon
POPR	Poa	pratensis	Kentucky bluegrass
PORE5	Potentilla	recta	sulfur cinquefoil
POVI9	Polypogon	viridis	beardless rabbitsfoot grass
RHLA3	Rhus	lanceolata	prairie sumac
ROMI3	Rorippa	microphylla	onerow yellowcress
RUAC2	Rumex	acetosa	garden sorrel
RUCR	Rumex	crispus	curly dock
RUDI2	Rubus	discolor	Himalayan blackberry
RUOB	Rumex	obtusifolius	broadleaf dock
SAAE	Salvia	aethiopis	Mediterranean sage
SACO8	Salsola	collina	slender Russian thistle

SALSO	Salsola	species	Russian thistle
SAMO5	Salvinia	molesta	giant salvinia
SAPA8	Salsola	paulsenii	barbwire Russian thistle
SARA3	Saccharum	ravennae	Ravennagrass
SATR12	Salsola	tragus	Russian thistle
SCAR	Schismus	arabicus	Arabian schismus
SCBA	Schismus	barbatus	common Mediterranean grass
SEAR13	Senna	artemisioides	silver senna
SEVI4	Setaria	viridis	green foxtail
SEVU	Senecio	vulgaris	common groundsel
SIAL2	Sisymbrium	altissimum	tumble mustard
SIAR4	Sinapis	arvensis	wild mustard
SIIR	Sisymbrium	irio	London rocket
SIMA3	Silybum	marianum	milk thistle
SIVU	Silene	vulgaris	bladder campion
SOAR2	Sonchus	arvensis	marsh sowthistle
SOAS	Sonchus	asper	spiny sowthistle
SOHA	Sorghum	halapense	Johnsongrass
SONI	Solanum	nigrum	black nightshade
SOOL	Sonchus	oleraceus	common sowthistle
SPSA3	Sphaerophysa	salsula	Swainsonpea
TAAP	Tamarix	aphylla	Athel tamarisk
TACA8	Taeniatherum	caput-medusae	medusahead
TACH2	Tamarix	chinensis	fivestamen tamarisk
TAMAR2	Tamarix	species	tamarisk
TAOF	Taraxacum	officinale	common dandelion
TAPA4	Tamarix	parviflora	smallflower tamarisk
TARA	Tamarix	ramosissima	saltcedar
TAVU	Tanacetum	vulgare	common tansy
TRAE	Triticum	aestivium	common wheat
TRAGO	Tragopogon	species	goatsbeard
TRDU	Tragopogon	dubius	yellow salsify
TRPO	Tragopogon	porrifolius	common salsify
TRPR	Tragopogon	pratensis	meadow salsify
TRRE3	Trifolium	repens	white clover
TRTE	Tribulus	terrestris	puncturevine
ULPU	Ulmus	pumila	Siberian elm
VEBL	Verbascum	blattaria	moth mullein
VETH	Verbascum	thapsus	common mullein
VIMA	Vinca	major	bigleaf periwinkle
VIMI2	Vinca	minor	common periwinkle

Table 4B. Local Land Owners for Arizona (other states pending)

Arizona State, Dept. Game and Fish
Arizona State, State Parks and Recreation
Arizona State, Trust Land
BLM, AZ State Office, Phoenix
BLM, Farmington Field Office
Blue Range Primitive Area
Bureau of Land Management
Bureau of Reclamation
Dept. Defense, Luke-Williams Range
Dept. Defense, Navajo Army Depot
Military, Barry M. Goldwater Air Force Range
Military, Yuma Proving Grounds
National Forest, Apache-Sigreaves
National Forest, Coconino
National Forest, Coronado
National Forest, Gila
National Forest, Kaibab
National Forest, Prescott
National Forest, Tonto
National Historic Park, Tumacacori
National Historic Site, Fort Bowie
National Historic Site, Hubble Trading Post
National Memorial, Coronado
National Monument, Agua Fria
National Monument, Canyon De Chelly
National Monument, Casa Grande Ruins
National Monument, Chiricahua
National Monument, El Morro
National Monument, Montezuma Castle
National Monument, Montezuma Well
National Monument, Navajo
National Monument, Parashant
National Monument, Pipe Spring
National Monument, Sunset Crater
National Monument, Tonto
National Monument, Tuzigoot
National Monument, Walnut Canyon
National Monument, Wupatki
National Park, Grand Canyon
National Park, Organ Pipe Cactus
National Park, Petrified Forest
National Park, Saguaro
National Recreation Area, Glen Canyon
National Recreation Area, Lake Mead
National Wildlife Refuge, Bill Williams River
National Wildlife Refuge, Buenos Aires
National Wildlife Refuge, Cabeza Prieta
National Wildlife Refuge, Cabeza Prieta

National Wildlife Refuge, Havasu
 National Wildlife Refuge, Imperial
 National Wildlife Refuge, Imperial Mtn
 National Wildlife Refuge, Kofa
 National Wildlife Refuge, San Bernardino and Leslie Canyon
 National Wildlife Refuge, Cibola
 New Mexico State, New Mexico Department of Transportation
 Other
 Private
 Tribal, Ak-Chin
 Tribal, Colorado River Indian Tribe
 Tribal, Fort McDowell
 Tribal, Fort Mohave Indian Tribe
 Tribal, Gila River Community
 Tribal, Havasupai
 Tribal, Hopi Tribe
 Tribal, Hualapai
 Tribal, Kaibab-Paiute
 Tribal, Navajo Nation
 Tribal, Salt River Tribe
 Tribal, San Carlos Apache
 Tribal, Southern Paiute Field Station
 Tribal, Tohono O'odham
 Tribal, White Mtn Apache
 Tribal, Yavapai Prescott Indian
 Unknown
 Utah State, Utah Department of Natural Resource

Table 5B. National Land Owners

Arizona State
 Bureau of Land Management
 Bureau of Reclamation
 Colorado State
 County
 Department of Defense
 Department of Energy
 National Forest Service
 National Park Service
 National Wildlife Refuge
 Nevada State
 New Mexico State
 Other
 Private
 Tribal
 Unknown
 Utah State

Appendix C: Tips for Using the SWEMP Data Query Tool

- Use the data query tool extract subsets of data from the current SWEMP database.
- You can set filters from the pull down lists for four criteria: weed name, land administrator, size of infestation and geographic boundary. You can choose only one filter for each criterion.
- You can design a query to extract data from a Cooperative Weed Management Area (CWMA). The map we use to assign a CWMA to an observation is also one of the reference data layers on the SWEMP IMS.
- Click the “Run Query” button to view your selected data. Only ten records show at a time on the screen; however, the number of records in total for your query is shown at the bottom of the screen.
- Click the Site Number to get more information about any record.
- Download the selected data by clicking the “Download Data” button. The download file has all the SWEMP fields for the data query.

Appendix D: Tips for Using SW-WIMS

The USGS Southwest Biological Science Center SWEP team has modified SW-WIMS to facilitate the use of WIMS in the Southwest. The WIMS User's Guide still applies to SW-WIMS, as long as a few things are noted:

- **DO NOT** install the base data provided for WIMS. The SW-WIMS has incorporated base data applicable to the Southwest.
- SW-WIMS provides customized pull down lists for: Plant Name, Common Name, State/Country, and County.
 - Plant Name: Table 3B in Appendix B "Guide to the SWEMP Database" is the list of plant for SW-WIMS. In future updates of SW-WIMS, the SWEMP team can add additional weed names to the list.
 - Common Name: Table 3B in Appendix B "Guide to the SWEMP Database" lists the common names used for SW-WIMS and for SWEMP.
 - State/Country: This list has been edited to include any state for which SWEMP accepts data for all or part of the state. The acronyms are: AZ (Arizona), CO (Colorado), NM (New Mexico), NV (Nevada), SO (Sonora, Mexico) and UT (Utah).
 - County: Counties for the complete states of Arizona and New Mexico are listed as well as adjacent counties in CO, NM, Nevada and Utah.

- The new fields added to SW-WIMS are: Local Owner, National Owner, and Vegetation.
 - Local Owner: This list of landowners, used to identify the landowner of the site of infestation, is from the local owners currently in the SWEMP database. We expect to add more to this list. If the Local Owner that you need is not on the list, use Other. We will add additional Local Owners with updates of the SW-WIMS. Please let the SWEMP team know of needed additions.
 - National Owner: This list gives the overall category of land administrator for the Local Owner's list.
 - Vegetation: This list of general vegetation types can be used to indicate the type of plant community in which the infestation occurs.
- Data items that are required in order to make the data compatible with the SWEMP regional database are indicated in red on SW-WIMS. These data items are: Plant Name, Latitude, Longitude, State/Prov., County, Local Owner, National Ownership, Discovery Year/Collection Date, Area/CWMA, and either Gross Area and Canopy Cover or Infested Area.
- The Area/CWMA is user defined. A single observation can have more than one Area assigned to it, a feature that can be used to show nested information. For example, the primary area might be King of Arizona CWMA, the second area Kofa Wildlife Reserve, and the third area a user area within the Reserve. We recommend that the primary area always be the weed management area that the occurrence is found in.
- The Voucher Information box is available to indicate that a voucher has been collected. Please check the box if you collected and prepared a voucher specimen. You can enter detailed information on the voucher in the Comments box below the Voucher Information button.
- Two types of data export are possible: the WIMS NAWMA export and the SWEMP export. The SWEMP export can be used to extract files to send to the SWEMP team for inclusion in the SWEMP regional database. Fill out the contact information if you are using the SWEMP export.

Appendix E: Tips for SWEMP Web Data Entry

These tips will appear in the next version of the User's Guide but we will post it earlier on the web as a separate.

Appendix F: Weed Management Activities and Computer Tools

These tips will appear in the next version of the User's Guide but we will post it earlier on the web as a separate appendix.